PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference BIF11604/LK	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP2004/004527	International filing date *(day/month/year)* 20.04.2004	Priority date *(day/month/year)* 23.04.2003
International Patent Classification (IPC) or both national classification and IPC B67D5/70		
Applicant FMC TECHNOLOGIES SA et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
22.02.2005	29.07.2005
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Mueller, C Telephone No. +49 89 2399-6894

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP2004/004527

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-12 as originally filed

Claims, Numbers

1-12 received on 01.03.2005 with letter of 22.02.2005

Drawings, Sheets

1/14-14/14 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-12
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-12
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-12
	No:	Claims	

2. Citations and explanations

   see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1: FR-A-2 813 872 (FMC EUROPE) 15 March 2002 (2002-03-15)

D2: FR-A-1 415 279 (PARKER HANNIFIN CORP) 22 October 1965 (1965-10-22)

1. Document D1, which is considered to represent the most relevant state of the art to the subject matter of claim 1, discloses (the references in parenthesis applying to this document):

   An assembly (13) for loading and unloading products, comprising a balanced loading and unloading arm (14) installed at a first location and having a compass-style duct system (17) mounted by one of its ends on a base (12) and provided at the other of its ends with a connection system (28) suitable for connecting the compass-style duct system to a coupling means (29) installed at a second location.

1.1 The subject-matter of independent claim 1 differs from the disclosure of D1 in that:

   the assembly for loading and unloading products comprises, in addition, a cable joined on the one hand to means integral with the base and suitable for subjecting this cable to a constant tension and suitable for being joined, on the other hand, to the second location, and guiding means capable of co-operating with the cable so as to guide the connection system along a trajectory materialized by the said cable until the connection system is brought into a position of connection to the coupling means,

1.2 The subject-matter of independent claim 1 differs from the disclosure of D1 furthermore in that:

   the guiding means (9) comprise a drive winch (9), integral with the connection

system (5), suitable for providing the said guiding of the connection system (5) on the cable (7) and also suitable for entailing, by friction on the cable (7), the movement of the connection system (5) along the cable (7), when the latter is stretched between the first location and the second location.

1.3 The problem to be solved by the features under point 1.1 of the present invention (first objective problem) may therefore be regarded as providing a path by which a coupling head of an assembly for loading or unloading is guided from a resting position into its operating position. Thus, the first objective problem can be formulated as how to guide a coupling head of a loading system even when said two sites are moving with respect to each other.

1.4 The problem to be solved by the features under point 1.2 of the present invention (second objective problem) may therefore be regarded as propelling the coupling head along the tensioned cable, thus using the winch for tensioning the cable and for displacing the coupling head.

2. The document D2 anticipates the features necessary for solving the first objective problem (the references in parenthesis applying to this document):

The document discloses an installation for transferring liquid from a first vessel to a second vessel recognizing that it is difficult to align the male and the female part of the coupling properly especially since two vessels, even when they are moored, tend to move with respect to each other. Therefore, D2 suggests to extend a cable (30) between a first site (18) on the first vessel and a second site (40) on the second vessel. Subsequently (see page 2, col. 1, line 31 - page 2, col. 2, line 20), the transfer duct (28) is guided along said cable (30) and provides therefore a proper connection between male and female part of the coupling head (12).

2.1 Thus the features disclosed in D1 and D2 would be combined by the skilled person, without exercise of any inventive skills in order to solve the problem posed.
The application of the teachings of D2 to the apparatus of D1 is obvious for the skilled person since the objective problem, as laid out above, involves only the replacement of cables 32 and 41 of D1 by one cable 30 of D2.

2.2 In what concerns the second objective problem, none of the prior art neither anticipates nor fairly suggests the use of the features summarized under point 1.2 above in combination with a loading arm. Also the skilled person would to have to combine the teachings of at least three documents in order to obtain a solution for the first and second objective problem, which would automatically involve the excercise of inventive skill.

2.3 With respect to the above reasons, the subject-matter of independent claim 1 is therefore considered as involving an inventive step (Article 33(3) PCT) and meets the requirements of novelty, inventive step and industrial applicability as laid down by the PCT.

3. Claims 2-12 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty, inventive step and industrial applicability.

CLAIMS

1. Assembly for loading and unloading products, comprising a balanced loading and unloading arm (1) installed at a first location and having a compass-style duct system (2) mounted by one of its ends on a base (4) and provided at the other of its ends with a connection system (5) suitable for connecting the compass-style duct system (2) to a coupling means (6) installed at a second location, characterized in that it comprises, in addition, a cable (7) joined on the one hand to means (8) integral with the base (4) and suitable for subjecting this cable (7) to a constant tension and suitable for being joined, on the other hand, to the second location, and guiding means (9) capable of co-operating with the cable (7) so as to guide the connection system (5) along a trajectory materialized by the said cable (7) until the connection system (5) is brought into a position of connection to the coupling means (6), and in that the guiding means (9) comprise a drive winch (9), integral with the connection system (5), suitable for providing the said guiding of the connection system (5) on the cable (7) and also suitable for entailing, by friction on the cable (7), the movement of the connection system (5) along the cable (7), when the latter is stretched between the first location and the second location.

2. Loading and unloading assembly according to claim 1, characterized in that the cable is fitted, on its part intended to be joined to the second location, with means suitable for co-operating with a locking system integral with the second location and permitting the cable to be kept attached to the second location.

3. Loading and unloading assembly according to claim 2, characterized in that the said means suitable for co-operating with a locking system comprise a sleeve crimped onto the cable.

4. Assembly for loading and unloading products, comprising a balanced loading and unloading arm (1) installed at a first location and having a compass-style duct system (2) mounted by one of its ends on a

base (4) and provided at the other of its ends with a connection system (5) suitable for connecting the compass-style duct system (2) to a coupling means (6) installed at a second location, characterized in that it comprises, in addition, a cable (7) joined on the one hand to means (8) integral with the base (4) and suitable for subjecting this cable (7) to a constant tension and suitable for being joined, on the other hand, to the second location, and guiding means (10, 21) capable of co-operating with the cable (7) so as to guide the connection system (5) along a trajectory materialized by the said cable (7) until the connection system (5) is brought into a position of connection to the coupling means (6), and in that the said guiding means (10, 21) comprise means (21) for attaching the connection system (5) onto the cable (7) and also means (10) of winding the cable (7), installed at the first location, the cable (7) being connected by one of its ends to the means (8) suitable for subjecting this cable to a constant tension and, by the other of its ends, to the said winding means (10), whilst the cable is joined to the second location by a return pulley useful for returning it to the first location.

5. Loading and unloading assembly according to claim 4, characterized in that the said means for winding the cable comprise an approach winch integral with the base.

6. Loading and unloading assembly according to one of claims 1 to 5, characterized in that the cable crosses the connection system from one side to the other.

7. Loading and unloading assembly according to one of claims 1 to 6, characterized in that the means suitable for subjecting the cable to a constant tension also comprise an emergency disconnection system for the cable.

8. Loading and unloading assembly according to claim 7, characterized in that the means suitable for subjecting the cable to a constant tension comprise a winder and in that said emergency disconnection system comprises a device for clamping the cable suitable for releasing the cable

when the latter is unwound beyond a predetermined maximum number of turns.

9. Loading and unloading assembly according to one of claims 1 to 8, characterized in that it comprises an alignment guide integral with the connection system and capable of keeping at a distance from the connection system a ring through which the cable passes.

10. Loading and unloading assembly according to one of claims 1 to 9, characterized in that it comprises a rotation device capable of ordering an angular movement of the connection system relative to the compass-style duct system.

11. Combination comprising an assembly according to one of claims 1 to 10, characterized in that it also comprises coupling means fitted with means for fixing to the second location, these coupling means being suitable for co-operating with the said connection system.

12. Combination according to claim 11, characterized in that the connection system comprises a female truncated conical element and in that the coupling means comprise a male truncated conical element, the female truncated conical element and the male truncated conical element being suitable for fitting into each other in order to define a relative positioning of the said assembly and said coupling means.